

# INOvent<sup>®</sup> delivery system

FOR NITRIC OXIDE THERAPY

## INOvent application update #10

Revised June 2002

Please place with INOvent Operation and Maintenance Manual.

### Use of nasal cannula with the INOvent delivery system

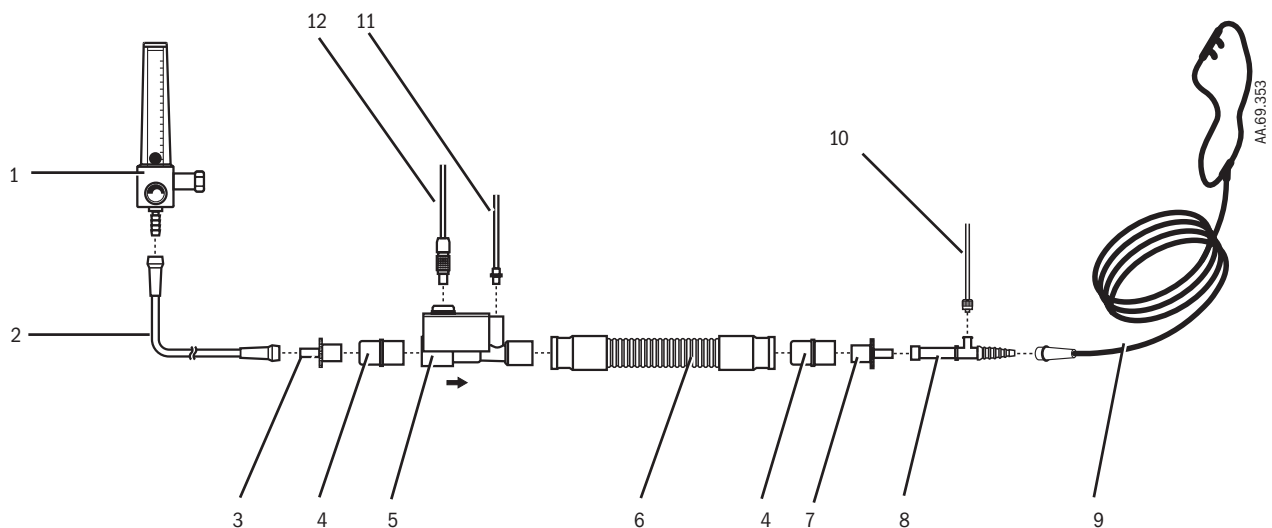
The purpose of this application update is to provide users with the proper method to deliver therapeutic inhaled nitric oxide (NO) via nasal cannula.

The INOvent delivery system can be used with nasal cannula to deliver NO concentrations from 5-40ppm (using 800 ppm or less source gas), and an oxygen flow rate as low as 1 LPM. The maximum flow rate should not produce a back pressure of 70 cmH<sub>2</sub>O or more, when measured at the gas sampling tee. As an example, adult and pediatric cannulae are capable of delivering up to 6 LPM without creating undue back pressure. However, an infant cannula can cause higher pressures at lower flow rates because of the smaller cannula nares.

Increasing the NO setting will increase the NO flow rate, which may cause a bolus of NO<sub>2</sub> to be delivered to the patient. This is due to residual NO<sub>2</sub> build-up within the INOvent at very low NO flow rates. If the NO setting is increased by more than 5 ppm within a 5-minute period of time, a quick purge of the INOvent should be performed.

To perform a quick purge, disconnect the cannula from the sample tee and increase the oxygen flow to 15 LPM at the desired NO setting for 1 minute. When purge is complete, reduce the oxygen flow to desired setting and reconnect cannula to sample tee.

**WARNING: Do not deliver >40 ppm nitric oxide via nasal cannula.**



- |                             |                                     |
|-----------------------------|-------------------------------------|
| 1 O <sub>2</sub> Flowmeter  | 7 15M x 4.5 mm Adapter              |
| 2 O <sub>2</sub> Tubing     | 8 O <sub>2</sub> Tubing Sample Tee  |
| 3 15M x 4.5 mm Adapter      | 9 Patient nasal cannula             |
| 4 22M/15F x 22M/15F Adapter | 10 Patient gas sample               |
| 5 Injector Module           | 11 NO/N <sub>2</sub> Injector Tube  |
| 6 300 mm of 22 mm Hose      | 12 Injector Module Electrical Cable |

## INOvent delivery system and the Bunnell Life Pulse® High-Frequency Jet Ventilator

The purpose of this application update is to provide information about a potential safety problem if the INOvent delivery system is used with the Bunnell Life Pulse High-Frequency Jet Ventilator.

Datex-Ohmeda has not approved the INOvent delivery for use with the Bunnell Life Pulse High-Frequency Jet Ventilator and it is not included in the FDA approved product labeling. However, an abstract was presented at the 1999 Snowbird High Frequency Ventilation Conference that describes the use of the INOvent delivery system with the Bunnell Life Pulse High-Frequency Jet Ventilator, (“The Use of Inhaled Nitric Oxide (iNO) in Conjunction with High Frequency Jet Ventilation” by Richter et al). The abstract describes the performance when the injector module (and hence internal NO delivery tubing in the INOvent delivery system) is connected just proximal to the Life Pulse humidifier chamber. According to the information presented in this abstract, the operating pressure within this part of the ventilator circuit can be as high as 20 psi. The INOvent delivery system was not designed for these high operating pressures and clinicians should be aware that these high pressures could cause disconnection of internal NO delivery tubing within the INOvent delivery system. In this situation, not only will NO therapy be interrupted but also the operating pressure for the high frequency ventilation will be lost.

If clinicians choose to use the INOvent delivery system with the Bunnell Life Pulse High-Frequency Jet Ventilator in research protocols they should limit the normal operating pressure seen by the INOvent injector module to a maximum of 8 psi to help avoid the risk of tubing disconnect.

Datex-Ohmeda provides this information to inform clinicians of the operating limits of the INOvent delivery system and it does not advocate the use of the INOvent delivery system with the Bunnell Life Pulse High-Frequency Jet Ventilator.

Life Pulse is a registered trademark of Bunnell Incorporated.



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